REMARKS

Claims 15-26 were previously pending. Claims 22 and 25 are amended. No claims have been canceled.

Applicants note with appreciation the Examiner's indication that the application is in condition for allowance except for his request to comply with the new interference rules.

Information Disclosure Statements

The Applicants submit herewith two Information Disclosure Statements (IDS) seeking additional compliance with MPEP § 2001.06 identifying litigation related documents. One IDS provides references potentially subject to a protective order in a now-settled litigation in related patents, and the other IDS provides a copy of a Federal Circuit decision based that litigation. While the Applicants do not believe that these references will affect the patentability of the pending claims, the Applicants respectfully request the consideration of the same.

Interference Issues

A Request for Interference was filed in this case on November 17, 1998. Since that date, the rules regarding interference practice were amended. The present Office Action requests compliance with the rules propagated after the November 17, 1998 filing. Accordingly, Applicants herewith resubmit the request to have an interference declared between this application and an unexpired patent. Pursuant to 37 CFR § 41.202, Applicants submit the following information.

(1) Identification of the Patent -- 37 CFR § 41.202(a)(1)

Applicants seek an interference with U.S. Patent No. 5,687,722 (the '722 patent), which issued on November 18, 1997 to Jonathon Tien. The '722 patent is entitled SYSTEM AND METHOD FOR THE ALGEBRAIC DERIVATION OF PHYSIOLOGICAL SIGNALS, and at issuance was assigned to SpaceLabs Medical, Inc., of Redmond, WA.

(2) Presentation of the Proposed Counts -- 37 CFR § 41.202(a)(2)

Claims 1-7 and 10-28 of the '722 patent are believed to interfere with Claims 15-19 and 22-26 of the present application. Proposed Count 1, presented below, corresponds to these claims.

Claims 8 and 9 of the '722 patent are believed to interfere with Claims 20 and 21 of the present application. Proposed Count 2, also presented below, corresponds to these claims.

Count 1

A system for the enhancement of physiological signals for the measurement of blood oxygen in a subject, the system comprising:

first and second light sources to direct light toward the subject, said first and second light sources producing light of first and second wavelengths, respectively;

a light detector positioned to detect said first and second light signals after interaction with the subject and to generate first and second signals indicative of an intensity of said first and second detected light signals, respectively, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source, said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference source;

a packet generator to generate a plurality of data packets derived from data comprising said first and second generated signals;

wherein said first and second portions of said first and second generated signals and a ratio of said first portion of said first generated signal to said first portion of said second generated signal have a mathematical relationship; and

a calculator using said mathematical relationship to generate at least first and second functions from said plurality of data packets, said at least first and second functions having a final solution value indicative of said ratio.

Count 2

A system for the enhancement of physiological signals for the measurement of blood oxygen in a subject, the system comprising:

first and second light sources to direct light toward the subject, said first and second light sources producing light of first and second wavelengths, respectively;

a light detector positioned to detect said first and second light signals after interaction with the subject and to generate first and second signals indicative of an intensity of said first and second detected light signals, respectively, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source, said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference source;

a packet generator to generate a plurality of data packets derived from data comprising said first and second generated signals;

wherein said first and second portions of said first and second generated signals and a ratio of said first portion of said first generated signal to said first portion of said second generated signal have a mathematical relationship; and

a calculator using said mathematical relationship to generate at least first and second functions from said plurality of data packets, said at least first and second functions having a final solution value indicative of said ratio, wherein said mathematical relationship has the following form:

$$-R_1(t_i) + (r_a + r_v)R_{12}(t_i) - r_a r_v R_2(t_i) = 0$$

where r_a is said ratio, i=1 to 2 for said first and second data packets, respectively, $R_1(t_i)$ is the

energy of said first generated signal in the ith data packet, $R_2(t_i)$ is the energy of said second

generated signal in the ith data packet, $R_{12}(t_i)$ is the correlation between said first and second

generated signals in the ith data packet, and r_v represents a ratio variable of a portion of said first

generated signal to a corresponding portion of said second generated signal.

(3) Explanation of Why the Claims Interfere -- 37 CFR § 41.202(a)(3)

The following claim charts compare the claims of the present application with the claims

of the '722 patent. The claim chart also shows why the claims interfere within the meaning of 37

CFR § 41.203(a).

COMPARISON OF PENDING CLAIMS 15 - 26 WITH THE '722 PATENT CLAIMS

Pending Claim 15	'722 patent Claim 1	Reason for Interference
A system for the enhancement of physiological signals for the measurement of blood oxygen in a subject, the system comprising:	A system for the enhancement of physiological signals for the measurement of blood oxygen in a subject, the system comprising:	The preamble recitation of each of pending Claim 15 and '722 patent Claim 1 is identical. Applicants take no position as to whether this portion of the claims constitutes a limitation. To the extent the preamble recitation constitutes a limitation, each claim would anticipate the other as to the preamble recitation.
first and second light sources to direct light toward the subject, said first and second light sources producing light of first and second wavelengths, respectively;	first and second light sources to direct light toward the subject, said first and second light sources producing light of first and second wavelengths, respectively;	Pending Claim 15 and '722 patent Claim 1 would each anticipate the other as to this limitation.
a light detector positioned to detect said first and second light signals after interaction with the subject and to	a light detector positioned to detect first and second light signals after interacting with the subject and to generate	Pending Claim 15 and '722 patent Claim 1 would each anticipate or render obvious the other as to this limitation.

generate first and second signals indicative of an intensity of said first and second detected light signals, respectively, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source, said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference source;	first and second signals indicative of an intensity of said first and second detected light signals, respectively, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference light source, said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference light source;	
a packet generator to generate a plurality of data packets derived from data comprising said first and second generated signals;	a window generator to generate first and second data windows derived from data comprising said first and second generated signals;	Pending Claim 15 and '722 patent Claim 1 would each anticipate or render obvious the other as to this limitation.
wherein said first and second portions of said first and second generated signals and a ratio of said first portion of said first generated signal to said first portion of said second generated signal have a mathematical relationship; and	a storage location containing a mathematical relationship of said first and second portions of said first and second generated signals and a ratio of said first portion of said first generated signal to said first portion of said second generated signal; and	Pending Claim 15 and '722 patent Claim 1 would each anticipate or render obvious the other as to this limitation.
a calculator using said mathematical relationship to generate at least first and second functions from said plurality of data packets, said at least first and second functions having a final solution value indicative of said ratio.	a calculator using said mathematical relationship to generate first and second functions using said first and second data windows, respectively, said first and second functions having a point of intersection indicative of said ratio.	Pending Claim 15 and '722 patent Claim 1 would each anticipate or render obvious the other as to this limitation.

Pending Claim 16	'722 Claim 2	Reason for Interference
The system of Claim 15	The system of claim 1 wherein	Pending Claim 16 and '722

| wherein said ratio is indicative of blood oxygen saturation in the subject, the system further including a look-up table containing data relating said ratio to said blood oxygen saturation. | said ratio is indicative of blood oxygen saturation in the subject, the system further including a look-up table containing data relating said ratio to said blood oxygen saturation. | patent Claim 2 would each anticipate the other as to this limitation. |

Pending Claim 17	'722 Claim 3	Reason for Interference
The system of Claim 15 wherein at least one of said data packets comprises filtered data from at least one of said first and second generated signals.	The system of claim 1 wherein said first data window is a derivative of said first and second generated signals.	Pending Claim 17 and '722 patent Claim 3 would each anticipate or render obvious the other as to this limitation.

Pending Claim 18	'722 Claim 4	Reason for Interference
The system of Claim 15 wherein at least one of said data packets comprises a component of at least one of said first and second generated signals with the DC removed.	The system of claim 1 wherein said first data window is an alternating current (AC) component of said first and second generated signals.	Pending Claim 18 and '722 patent Claim 4 would each anticipate or render obvious the other as to this limitation.

Pending Claim 19	'722 Claim 5	Reason for Interference
The system of Claim 15 wherein at least one of said data packets is derived from a group of signals comprising said first generated signal, filtered data from said first generated signal, said second generated signal, filtered data from said second generated signal, and filtered data from a combination of said first and second generated signals.	The system of claim 1 wherein said first data window is derived from a group of signals comprising said first generated signal, a mathematical derivative of said first generated signal, said second generated signal, a mathematical derivative of said second generated signal, a combination of said first and second generated signals, and a mathematical derivative of said combination of said first and second generated signals.	Pending Claim 19 and '722 patent Claim 5 would each anticipate or render obvious the other as to this limitation.

Pending Claim 20	'722 Claim 8	Reason for Interference
The system of Claim 15 wherein said mathematical	The system of claim 1 wherein said mathematical relationship	Pending Claim 20 and '722 patent Claim 8 would each

relationship has the following form: $-R_1(t_i) + (r_a + r_v)R_{12}(t_i) - r_a r_v R_2(t_i) = 0$	has the following form: $$\alpha i = Fi(\beta) = \dfrac{\int_t R_i^2(t) - \beta \int_t R_i(t) r_i(t)}{\int_t R_i(t) r_i(t) - \beta \int_t r_i^2(t)}$$	anticipate or render obvious the other as to this limitation.
where r_a is said ratio, i=1 to 2 for said first and second data packets, respectively, $R_1(t_i)$ is the energy of said first generated signal in the ith data packet, $R_2(t_i)$ is the energy of said second generated signal in the ith data packet, $R_{12}(t_i)$ is the correlation between said first and second generated signals in the ith data packet, and r_v represents a ratio variable of a portion of said first generated signal to a corresponding portion of said second generated signal	where α. is said ratio, i=1 to 2 for said first and second data windows, respectively, $R_i(t)$ is said first generated signal in the ith data window, $r_i(t)$ is said second generated signal in the ith data window, and β represents a ratio variable of a portion of said first generated signal to a corresponding portion of said second generated signal.	Pending Claim 20 and '722 patent Claim 8 would each anticipate or render obvious the other as to this limitation.

Pending Claim 21	'722 Claim 9	Reason for Interference
The system of Claim 20 wherein said calculator is configured to solve for a pair of values, r_a and r_v, by solving linear functions in x and y having the following form:	The system of claim 8 wherein said calculator is configured to solve for a pair of values for α and β, respectively, by setting $F_1(\beta)=F_2(\beta)$ and solving for the (α,β) pair using a mathematical function having the following form:	Pending Claim 21 and '722 patent Claim 9 would each anticipate or render obvious the other as to this limitation.
$R_{12}(t_1) x - R_2(t_1)y = R_1(t_1)$ $R_{12}(t_2) x - R_2(t_2)y = R_1(t_2)$ where $x = r_a + r_v$; $y = r_a r_v$	$$(\alpha,\beta) = \begin{Bmatrix} \int_t r_1^2(t) \int_t R_2^2(t) - \int_t R_1^2(t) \int_t r_2^2(t) \\[4pt] \begin{bmatrix} \left(\int_t r_1^2(t) \int_t R_2^2(t) - \int_t r_1^2(t) \int_t R_2^2(t) \right) - \\ 4 \times \left(\int_t r_1^2(t) \int_t R_2(t) r_2(t) - \int_t R_1(t) r_1(t) \int_t r_2^2(t) \right) \times \\ \left(\int_t R_1(t) r_1(t) \int_t R_2^2(t) - \int_t R_1^2(t) \int_t R_2(t) r_2(t) \right) \end{bmatrix}^{\frac{1}{2}} \end{Bmatrix}^x \\ \left[2 \times \left(\int_t r_1^2(t) \int_t R_2(t) r_2(t) - \int_t R_1(t) r_1(t) \int_t r_2^2(t) \right) \right]^{-1}$$	Pending Claim 21 and '722 patent Claim 9 would each anticipate or render obvious the other as to this limitation.

Pending Claim 22	'722 Claim 11	Reason for Interference
A method using a computer for the enhancement of physiological signals for the measurement of blood oxygen in a subject, the method comprising the steps of:	A method using a computer for the enhancement of physiological signals for the measurement of blood oxygen in a subject, the method comprising the steps of:	The preamble recitation of each of pending Claim 22 and '722 patent Claim 11 is identical. Applicants take no position as to whether this portion of the claims constitutes a limitation. To the extent the preamble recitation constitutes a limitation, each claim would anticipate the other as to the preamble recitation.
directing first an second light sources toward the subject, said first and second light sources producing light of first and second wavelength, respectively.	directing first and second light sources toward the subject, said first and second light sources producing light of first and second wavelengths, respectively;	Pending Claim 22 and '722 patent Claim 11 would each anticipate the other as to this limitation.
detecting first and second light signals after interaction with the subject and generating signals indicative of an intensity of said first and second detected light signals, said first generated signals having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source, said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference source.	detecting first and second light signals after interaction with the subject and generating signals indicative of an intensity of said first and second detected light signals, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference light source, said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference light source;	Pending Claim 22 and '722 patent Claim 11 would each anticipate or render obvious the other as to this limitation.
generating a plurality of data packets derived from data comprising said first and second generated signals, and	generating a plurality of data windows derived from data comprising said first and second generated signals; and	Pending Claim 22 and '722 patent Claim 11 would each anticipate the other as to this limitation.
using a mathematical	using a mathematical	Pending Claim 22 and '722

| relationship of said first and second portions of said first and second generated signals and a ratio of said first portion of said first generated signal to said first portion of said second generated signal to generate at least first and second functions from said plurality of data packets, said at least first and second functions having a solution value indicative of said ratio. | relationship of said first and second portions of said first and second generated signals and a ratio of said first portion of said first generated signal to said first portion of said second generated signal to generate a plurality of functions from said plurality of data windows, respectively, said plurality of functions having a solution value indicative of said ratio. | patent Claim 11 would each anticipate or render obvious the other as to this limitation. |

Pending Claim 23	'722 Claim 14	Reason for Interference
The method of Claim 22 wherein said ratio is indicative of blood oxygen saturation in the subject, the method further including the step of using a look-up table containing data relating said ratio to said blood oxygen saturation to determine the blood oxygen level in the subject.	The method of claim 11 wherein said ratio is indicative of blood oxygen saturation in the subject, the method further including the step of using a look-up table containing data relating said ratio to said blood oxygen saturation to determine the blood oxygen level in the subject.	Pending Claim 23 and '722 patent Claim 14 would each anticipate or render obvious the other as to this limitation.

Pending Claim 24	'722 Claim 15	Reason for Interference
The method of Claim 22 wherein at least one of said plurality of data packets comprises filtered data from said first generated signal.	The method of claim 11 wherein a first of said plurality of data windows is a derivative of said first generated signal.	Pending Claim 24 and '722 patent Claim 15 would each anticipate or render obvious the other as to this limitation.

Pending Claim 25	'722 Claim 16	Reason for Interference
The method of Claim 22 wherein at least one of said plurality of data packets comprises a component of said first generated signal with the DC removed.	The method of claim 11 wherein a first of said plurality of data windows is an alternating current (AC) component of said first generated signal.	Pending Claim 25 and '722 patent Claim 16 would each anticipate or render obvious the other as to this limitation.

Pending Claim 26	'722 Claim 23	Reason for Interference

The method of Claim 22 wherein at least one of said plurality of data packets is derived from a group of signals comprising said first generated signal, filtered data from said first generated signal, said second generated signal, filtered data from said second generated signal, a combination of said first and second generated signals, and filtered data from said combination of said first and second generated signals.	The system of claim 21 wherein a first of said plurality of data windows is derived from a group of signals comprising said first generated signal, a mathematical derivative of said first generated signal, said second generated signal, a mathematical derivative of said second generated signal, a combination of said first and second generated signals, and a mathematical derivative of said combination of said first and second generated signals.	Pending Claim 26 and '722 patent Claim 23 would each anticipate or render obvious the other as to this limitation.

(4) Applicants Will Prevail on Priority -- 37 CFR § 41.202(a)(4)

Applicants will prevail on priority in an interference, if declared. Applicants would be the Senior Party in an interference. In particular, the '722 patent lists an earliest priority date of May 17, 1995. Applicants are entitled to constructively claim priority to, *inter alia*, U.S. Application No. 08/320,154, filed October 7, 1994. Accordingly, the Applicants can prove a constructive reduction to practice earlier than the earliest constructive reduction to practice of the '722 patent. Moreover, Applicants are able to prove a date of invention prior to constructive reduction to practice. For at least these reasons, Applicants will prevail on priority if an interference is declared.

(5) Written Description/Constructive Reduction to Practice -- 37 CFR § 41.202(a)(5),(6)

The following tables illustrate the written description support for Claims 15-26 in the pending application and priority applications[1].

Claim 15

A system for the enhancement of physiological signals for the measurement of blood oxygen in a	**09/195,791 (November 17, 1998)** p. 6, ll. 4-9;

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[1] The cited references are not exhaustive. In the event interference is declared, Applicants reserve the right to set forth additional citations or rely on one or more applications not cited herein.

subject, the system comprising:	p. 6, 1. 25 – p. 7, 1. 13; p. 63, 1. 33, p. 64, 1. 12 **08/859,837 (May 16, 1997)** p. 6, 11. 4-9; p. 6, 1. 25 – p. 7, 1. 13; p. 63, 1. 33, p. 64, 1. 12 **08/320,154 (October 17, 1994)** p. 6, 11. 4-9; p. 6, 1. 25 – p. 7, 1. 13; p. 63, 1. 33, p. 64, 1. 12
first and second light sources to direct light toward the subject, said first and second light sources producing light of first and second wavelengths, respectively;	**09/195,791 (November 17, 1998)** p. 8, 11. 1-4; p. 64, 1. 28, p. 65, 1.1 p. 65, 11. 18-24; p. 67, 11. 25-27; **08/859,837 (May 16, 1997)** p. 8, 11. 1-4; p. 64, 1. 28, p. 65, 1.1 p. 65, 11. 18-24; p. 67, 11. 25-27; **08/320,154 (October 17, 1994)** p. 8, 11. 1-4; p. 64, 1. 28, p. 65, 1.1 p. 65, 11. 18-24; p. 67, 11. 25-27;
a light detector positioned to detect said first and second light signals after interaction with the subject and to generate first and second signals indicative of an intensity of said first and second detected light signals, respectively, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source, said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference source;	**09/195,791 (November 17, 1998)** p. 7, 11. 13-36; p. 8, 1. 1-14; p. 18, 11. 8-29; Figures 4a-4b; p. 64, 11. 28-33; p. 65, 11. 20-28; p. 67, 11. 25-36; p. 114, 11. 3-16; Figures 26, 27 **08/859,837 (May 16, 1997)** p. 7, 11. 13-36; p. 8, 1. 1-14;

	p. 18, ll. 8-29; Figures 4a-4b; p. 64, ll. 28-33; p. 65, ll. 20-28; p. 67, ll. 25-36; p. 114, ll. 3-16; Figures 26, 27 **08/320,154 (October 17, 1994)** p. 7, ll. 13-36; p. 8, l. 1-14; p. 18, ll. 8-29; Figures 4a-4b; p. 64, ll. 28-33; p. 65, ll. 20-28; p. 67, ll. 25-36; p. 114, ll. 3-16; Figures 26, 27
a packet generator to generate a plurality of data packets derived from data comprising said first and second generated signals;	**09/195,791 (November 17, 1998)** p. 76, l. 35 – p. 77, l. 26; Figure 16 **08/859,837 (May 16, 1997)** p. 76, l. 35 – p. 77, l. 26; Figure 16 **08/320,154 (October 17, 1994)** p. 76, l. 35 – p. 77, l. 26; Figure 16
wherein said first and second portions of said first and second generated signals and a ratio of said first portion of said first generated signal to said first portion of said second generated signal have a mathematical relationship; and	**09/195,791 (November 17, 1998)** p. 16, l. 25 – p. 17, l. 8; p. 18, l. 8 – p. 19, l. 18; Figures 4a-4b; p. 23, ll. 9-29 and, in particular, Equations 5a-5b; p. 98, l. 21 – p. 99, l. 2; p. 120, ll. 23-30 **08/859,837 (May 16, 1997)** p. 16, l. 25 – p. 17, l. 8; p. 18, l. 8 – p. 19, l. 18; Figures 4a-4b; p. 23, ll. 9-29 and, in particular, Equations

	5a-5b; p. 98, l. 21 – p. 99, l. 2; p. 120, ll. 23-30 **08/320,154 (October 17, 1994)** p. 16, l. 25 – p. 17, l. 8; p. 18, l. 8 – p. 19, l. 18; Figures 4a-4b; p. 23, ll. 9-29 and, in particular, Equations 5a-5b; p. 98, l. 21 – p. 99, l. 2; p. 120, ll. 23-30
a calculator using said mathematical relationship to generate at least first and second functions from said plurality of data packets, said at least first and second functions having a final solution value indicative of said ratio.	**09/195,791 (November 17, 1998)** p. 98, l. 19 – p. 104, l. 16; Equations 100, 101 **08/859,837 (May 16, 1997)** p. 98, l. 19 – p. 104, l. 16; Equations 100, 101 **08/320,154 (October 17, 1994)** p. 98, l. 19 – p. 104, l. 16; Equations 100, 101

Claim 16

The system of Claim 15 wherein said ratio is indicative of blood oxygen saturation in the subject, the system further including a look-up table containing data relating said ratio to said blood oxygen saturation.	**09/195,791 (November 17, 1998)** p. 79, ll. 12-15; Figure 17; p. 81, ll. 19-26; Figure 18 **08/859,837 (May 16, 1997)** p. 79, ll. 12-15; Figure 17; p. 81, ll. 19-26; Figure 18 **08/320,154 (October 17, 1994)** p. 79, ll. 12-15; Figure 17; p. 81, ll. 19-26; Figure 18

Claim 17

The system of Claim 15 wherein at least one of said data packets comprises filtered data from at least one of said first and second generated signals.	**09/195,791 (November 17, 1998)** p. 69, ll. 27-30; p. 70, ll. 20-26; Figure 12; p. 78, ll. 12-25; Figure 17 **08/859,837 (May 16, 1997)** p. 69, ll. 27-30; p. 70, ll. 20-26; Figure 12; p. 78, ll. 12-25; Figure 17 **08/320,154 (October 17, 1994)** p. 69, ll. 27-30; p. 70, ll. 20-26; Figure 12; p. 78, ll. 12-25; Figure 17

Claim 18

The system of Claim 15 wherein at least one of said data packets comprises a component of at least one of said first and second generated signals with the DC removed.	**09/195,791 (November 17, 1998)** p. 77, l. 34 – p. 78, l. 11; Figure 17; p. 80, ll. 31-34; p. 82, l. 6 – p. 83, l. 8; Figure 18 **08/859,837 (May 16, 1997)** p. 77, l. 34 – p. 78, l. 11; Figure 17; p. 80, ll. 31-34; p. 82, l. 6 – p. 83, l. 8; Figure 18 **08/320,154 (October 17, 1994)** p. 77, l. 34 – p. 78, l. 11; Figure 17; p. 80, ll. 31-34; p. 82, l. 6 – p. 83, l. 8; Figure 18

Claim 19

The system of Claim 15 wherein at least one of said data packets is derived from a group of signals comprising said first generated signal, filtered data from said first generated signal, said second generated signal, filtered data from said second generated signal, and filtered data from a combination of said first and second generated signals.	**09/195,791 (November 17, 1998)** p. 69, ll. 27-30; p. 70, ll. 20-26; Figure 12; p. 78, ll. 12-25; Figure 17; p. 82, l. 6 – p. 83, l. 8; Figure 18 **08/859,837 (May 16, 1997)** p. 69, ll. 27-30; p. 70, ll. 20-26; Figure 12; p. 78, ll. 12-25; Figure 17; p. 82, l. 6 – p. 83, l. 8; Figure 18 **08/320,154 (October 17, 1994)** p. 69, ll. 27-30; p. 70, ll. 20-26;

	Figure 12; p. 78, ll. 12-25; Figure 17; p. 82, l. 6 – p. 83, l. 8; Figure 18

Claim 20

The system of Claim 15 wherein said mathematical relationship has the following form: $-R_1(t_i) + (r_a + r_v)R_{12}(t_i) - r_a r_v R_2(t_i) = 0$ where r_a is said ratio, i=1 to 2 for said first and second data packets, respectively, $R_1(t_i)$ is the energy of said first generated signal in the ith data packet, $R_2(t_i)$ is the energy of said second generated signal in the ith data packet, $R_{12}(t_i)$ is the correlation between said first and second generated signals in the ith data packet, and r_v represents a ratio variable of a portion of said first generated signal to a corresponding portion of said second generated signal.	**09/195,791 (November 17, 1998)** p. 101, l. 24 – p. 104, l. 16 Equations 98, 100, 101 **08/859,837 (May 16, 1997)** p. 101, l. 24 – p. 104, l. 16 Equations 98, 100, 101 **08/320,154 (October 17, 1994)** p. 101, l. 24 – p. 104, l. 16 Equations 98, 100, 101

Claim 21

The system of Claim 20 wherein said calculator is configured to solve for a pair of values, r_a and r_v, by solving linear functions in x and y having the following form: $R_{12}(t_1) x - R_2(t_1)y = R_1(t_1)$ $R_{12}(t_2) x - R_2(t_2)y = R_1(t_2)$ where $x = r_a + r_v$; $y = r_a r_v$	**09/195,791 (November 17, 1998)** p. 104, ll. 1-16; Equations 102-104 **08/859,837 (May 16, 1997)** p. 104, ll. 1-16; Equations 102-104 **08/320,154 (October 17, 1994)** p. 104, ll. 1-16; Equations 102-104

Claim 22

A method using a computer for the enhancement of physiological signals for the measurement of blood oxygen in a subject, the method comprising the steps of:	**09/195,791 (November 17, 1998)** p. 6, ll. 4-9; p. 6, l. 25 – p. 7, l. 13; p. 63, l. 33 – p. 64, l. 12 **08/859,837 (May 16, 1997)** p. 6, ll. 4-9; p. 6, l. 25 – p. 7, l. 13; p. 63, l. 33 – p. 64, l. 12 **08/320,154 (October 17, 1994)** p. 6, ll. 4-9; p. 6, l. 25 – p. 7, l. 13; p. 63, l. 33 – p. 64, l. 12
directing first and second light sources toward the subject, said first and second light sources producing light of first and second wavelength, respectively.	**09/195,791 (November 17, 1998)** p. 8, ll. 1-4; p. 64, l. 28 – p. 65, l. 1; p. 65, ll. 18-24; p. 67, ll. 25-27 **08/859,837 (May 16, 1997)** p. 8, ll. 1-4; p. 64, l. 28 – p. 65, l. 1; p. 65, ll. 18-24; p. 67, ll. 25-27 **08/320,154 (October 17, 1994)** p. 8, ll. 1-4; p. 64, l. 28 – p. 65, l. 1; p. 65, ll. 18-24; p. 67, ll. 25-27
detecting first and second light signals after interaction with the subject and generating signals indicative of an intensity of said first and second detected light signals, said first generated signals having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source, said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference source.	**09/195,791 (November 17, 1998)** p. 7, ll. 13-36; p. 8, l. 1-14; p. 18, ll. 8-29; Figures 4a-4b; p. 64, ll. 28-33; p. 65, ll. 20-28; p. 67, ll. 25-36; p. 114, ll. 3-16; Figure 26, 27

	08/859,837 (May 16, 1997) p. 7, ll. 13-36; p. 8, l. 1-14; p. 18, ll. 8-29; Figures 4a-4b; p. 64, ll. 28-33; p. 65, ll. 20-28; p. 67, ll. 25-36; p. 114, ll. 3-16; Figure 26, 27 **08/320,154 (October 17, 1994)** p. 7, ll. 13-36; p. 8, l. 1-14; p. 18, ll. 8-29; Figures 4a-4b; p. 64, ll. 28-33; p. 65, ll. 20-28; p. 67, ll. 25-36; p. 114, ll. 3-16; Figure 26, 27
generating a plurality of data packets derived from data comprising said first and second generated signals, and	**09/195,791 (November 17, 1998)** p. 76, l. 35 – p. 77, l. 26; Figure 16 **08/859,837 (May 16, 1997)** p. 76, l. 35 – p. 77, l. 26; Figure 16 **08/320,154 (October 17, 1994)** p. 76, l. 35 – p. 77, l. 26; Figure 16
using a mathematical relationship of said first and second portions of said first and second generated signals and a ratio of said first portion of said first generated signal to said first portion of said second generated signal to generate at least first and second functions from said plurality of data packets, said at least first and second functions having a solution value indicative of said ratio.	**09/195,791 (November 17, 1998)** p. 16, l. 25 – p. 17, l. 8; p. 18, l. 8 – p. 19, l. 18; figures 4a-4b; p. 23, ll. 9-29 and, in particular, Equations 5a, 5b; p. 120, ll. 23-30; p. 98, l. 17 – p. 104, l. 16; Equations 100, 101 **08/859,837 (May 16, 1997)**

	p. 16, l. 25 – p. 17, l. 8; p. 18, l. 8 – p. 19, l. 18; figures 4a-4b; p. 23, ll. 9-29 and, in particular, Equations 5a, 5b; p. 120, ll. 23-30; p. 98, l. 17 – p. 104, l. 16; Equations 100, 101 **08/320,154 (October 17, 1994)** p. 16, l. 25 – p. 17, l. 8; p. 18, l. 8 – p. 19, l. 18; figures 4a-4b; p. 23, ll. 9-29 and, in particular, Equations 5a, 5b; p. 120, ll. 23-30; p. 98, l. 17 – p. 104, l. 16; Equations 100, 101

Claim 23

The method of Claim 22 wherein said ratio is indicative of blood oxygen saturation in the subject, the method further including the step of using a look-up table containing data relating said ratio to said blood oxygen saturation to determine the blood oxygen level in the subject.	**09/195,791 (November 17, 1998)** p. 79, ll. 12-15; Figure 17; p. 81, ll. 19-26; Figure 18; p. 86, l. 6 – p. 89, l. 16 **08/859,837 (May 16, 1997)** p. 79, ll. 12-15; Figure 17; p. 81, ll. 19-26; Figure 18; p. 86, l. 6 – p. 89, l. 16 **08/320,154 (October 17, 1994)** p. 79, ll. 12-15; Figure 17; p. 81, ll. 19-26; Figure 18; p. 86, l. 6 – p. 89, l. 16

Claim 24

The method of Claim 22 wherein at least one of said plurality of data packets comprises filtered data from said first generated signal.	**09/195,791 (November 17, 1998)** p. 69, ll. 27-30; p. 70, ll. 20-26; p. 81, ll. 19-26; Figure 18; p. 86, l. 6 – p. 89, l. 16 **08/859,837 (May 16, 1997)** p. 69, ll. 27-30; p. 70, ll. 20-26; p. 81, ll. 19-26; Figure 18; p. 86, l. 6 – p. 89, l. 16 **08/320,154 (October 17, 1994)** p. 69, ll. 27-30; p. 70, ll. 20-26; p. 81, ll. 19-26; Figure 18; p. 86, l. 6 – p. 89, l. 16

Claim 25

The method of Claim 22 wherein at least one of said plurality of data packets comprises a component of said first generated signal with the DC removed.	**09/195,791 (November 17, 1998)** p. 77, l. 34 – p. 78, l. 11; Figure 17; p. 80, ll. 31-34; p. 82, l. 6 – p. 83, l. 8; Figure 18 **08/859,837 (May 16, 1997)** p. 77, l. 34 – p. 78, l. 11; Figure 17; p. 80, ll. 31-34; p. 82, l. 6 – p. 83, l. 8; Figure 18 **08/320,154 (October 17, 1994)** p. 77, l. 34 – p. 78, l. 11; Figure 17; p. 80, ll. 31-34; p. 82, l. 6 – p. 83, l. 8; Figure 18

Claim 26

The method of Claim 22 wherein at least one of said plurality of data packets is derived from a group of signals comprising said first generated signal, filtered data from said first generated signal, said second generated signal, filtered data from said second generated signal, a combination of said first and second generated signals, and filtered data from said combination of said first and second generated signals.	**09/195,791 (November 17, 1998)** p. 69, ll. 27 – 30; p. 70, ll. 20-26; Figure 12; p. 78, ll. 12 – 25; Figure 17; p. 82, l. 6 – p. 83, l. 8; Figure 18 **08/859,837 (May 16, 1997)** p. 69, ll. 27 – 30; p. 70, ll. 20-26; Figure 12; p. 78, ll. 12 – 25; Figure 17; p. 82, l. 6 – p. 83, l. 8; Figure 18 **08/320,154 (October 17, 1994)** p. 69, ll. 27 – 30; p. 70, ll. 20-26; Figure 12; p. 78, ll. 12 – 25; Figure 17; p. 82, l. 6 – p. 83, l. 8; Figure 18

Appl. No. : **09/195,791**
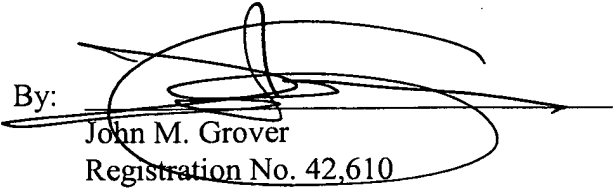**Filed** : **November 17, 1998**

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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